

REMARKS

Status of the Claims

Claim 1 has been amended.

Claim 17 was added.

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Claims 1, 2 and 17 are now pending.

Support for these amendments can be found in the application at least in Figure 8 and at page 31, lines 16 - 22.

Rejection of Claims 1 and 2 under Mueller et al under §102(e)

In the Office Action, claims 1 and 2 stand rejected under 35 U.S.C. §102(e) as being anticipated by Mueller et al. Applicants have amended claim 1. As amended, claims 1 and 2 are patentable over Mueller.

The Examiner states that Mueller discloses a slurry comprising an aqueous solution of an oxidizing agent, wherein the oxidizing agent is a monopersulfate. However, Mueller does not disclose either etching copper or, more specifically, etching copper at an approximately uniform rate, unlike the arrangement of amended claim 1. One advantage of an etching agent that has a uniform etching rate and a diminished etching rate dependency on time is an increase in the etching precision. Mueller, on the other hand, teaches a slurry to be used in a Chemical-Mechanical Polishing process ("CMP") rather than for copper. CMP is a process used to planarize a surface and remove surface defects. Controlling the etching rate of the etching agent is not of significant importance in Mueller. In contrast, the amended claim 1 recites an etching agent composition that specifically etches copper at a uniform rate. An etching agent must have a controllable etch rate, so that etching may be done with precision in order to form an etch pattern. Therefore, one skilled in the art would not look to the teaching of a CMP slurry composition in developing an etching agent composition. Claim 1 as amended is patentably distinguishable from the Mueller patent, and overcomes the rejection. Applicant additionally respectfully submits that dependent claim 2 is dependent on claim 1 and therefore also overcomes the rejection under Mueller.

Rejection of Claims 1 and 2 under Condra et al. and Kubotera et al. under §103(a)

In the Office Action, claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as being anticipated by Condra et al. in view of Kubotera et al. Applicants have amended claim 1, and submit that claims 1 and 2 are patentable over these references.

The Examiner states that Condra, in conjunction with Kubotera, makes obvious the arrangement recited in claim 1. The Examiner states that Condra fails to teach the concentration of the peroxycompound to be used in the etching agent disclosed in claim 1 of the instant application. See, Office Action at 4, II. 3 – 4. Kubotera teaches an etching reagent that comprises an oxidizing agent used in a concentration of 0.01% to a maximum of about 10% by weight. Amended claim 1 of the present application, on the other hand, recites an oxidizing agent concentration of a minimum of 10.01% to about 23.31%. As amended, the concentration range of the instant application no longer overlaps the range disclosed in Kubotera.

Further, the Examiner states that the concentration increase of the instant application would have been obvious as it reflects a result-effective variable. However, the concentration advised by Kubotera is that necessary to optimize the etch-bleaching of the etching agent. See, Kubotera at col. 13, II. 37 – 43. Kubotera teaches away from using a higher concentration of oxidizing agent by stating that there is no etch-bleaching advantage to be gained by using any higher of a concentration. However, one of the advantages of the instant application is that an increased concentration enhances the uniformity of the side-etching. See, Application at p. 48, I. 19 – p. 49, I. 1. Thus, any result-effective variable optimization taught by Kubotera to adjust the oxidizing agent concentration would not lead to the arrangement of claim 1 as there is an entirely different motivation from claim 1. Moreover, Kubotera specifically teaches away from increasing the concentration, as he teaches that no advantage is gained by increasing the concentration. Therefore, no amount of optimization of Kubotera would lead to an increased amount of oxidizing agent. It would not have been obvious to look towards the teachings of Kubotera to solve the problems addressed in the present application.

Thus, neither Kubotera nor Condra, alone or in combination, anticipate or suggest the arrangement of amended Claim 1. Applicants submit that amended Claim

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1 overcomes the §103(a) rejection. Applicants further respectfully submit that Claim 2 is dependent on Claim 1, and therefore also overcomes the §103(a) rejection.

Conclusion

In view of the amendments and arguments above, Applicants respectfully submit that all of the pending claims are in condition for allowance and seek an early allowance thereof. If for any reason the Examiner is unable to allow the application in the next Office Action and believes that a telephone interview would be helpful to resolve any remaining issues, he is respectfully requested to contact the undersigned.

Respectfully submitted,



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